

MARIJUANA DISPENSARIES PLACE CITIZENS AT RISK

Medicinal Marijuana Dispensary Practices Place Citizens at Risk

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CERTIFICATION STATEMENT

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Abstract

The problem is that the laws, procedures, and standards that apply to discarding of food products that contain Medical Marijuana have not been identified in the State of Colorado. The purpose of this applied research project was to identify strategies that could be utilized by North Washington Fire Protection District to mitigate a community threat created by the disposal of Medicinal Marijuana in food products.

The descriptive research method was utilized to answer the following questions a) What is the risk factor associated with medical marijuana in food products that are discarded?, b) What Federal, State, and Local Laws deal with the regulation of discarded medications in food products?, c) What are industry standards related to the discarding of medications in food products?, and d) How can the North Washington Fire Protection District mitigate the risk of medicinal marijuana in discarded food products within our community?

The procedures used during this research process involved the review of internet sources and printed publications; collection of data obtained through self created surveys of State Marijuana Programs, marijuana dispensaries, local veterinary clinics, pharmaceutical handlers, and other fire service based transport systems; and personal interviews with

Hospital Medical Directors, Law Enforcement, and the Nurse Manager of the Rocky Mountain Poison Center.

Results revealed no standards for disposal of food products that contain medicinal marijuana. The absence of regulation combined with an explosive growth of Medicinal Marijuana facilities, creates an increased potential for future exposures. This problem needs to be evaluated through improved efforts to obtain a better collection of data.

Recommendations included implementation of a consortium to lobby for regulation to address the disposal of food products containing medicinal marijuana. In addition, a campaign should be initiated to educate dispensaries, EMS services, and citizens on the risks of exposure to medicinal marijuana in discarded food products.

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Medicinal Marijuana Dispensary Practices Place Citizens at Risk

Introduction

Citizens throughout the United States are bombarded on a daily basis with issues related to medicinal marijuana. Newspaper articles, news programs, billboards, and even election ballots cause us to evaluate the risks and benefits of this substance. There are many important issues to contemplate: are there true medical benefits; should it be legalized; how will decisions effect related criminal activities; and much more. Despite the importance of these topics, this research project focused on a risk that affects unsuspecting members of our community. People are being exposed to marijuana in food products without even knowing it.

The problem is that the medical disposal laws, procedures, and standards that apply to discarding food products that contain Medical Marijuana have not been identified in the State of Colorado. Individuals uninvolved with marijuana use, medicinal or recreational, may now be placed at risk. The purpose of this applied research project is to identify strategies that will enable North Washington Fire Protection District to mitigate a community threat created by the disposal of Medicinal Marijuana in food products.

Descriptive research is utilized to evaluate current practices and situations throughout the EMS providing Fire Service community. Research questions developed for this project include a) What is the risk factor associated with medical marijuana in food products that are discarded?, b) What Federal, State, and Local Laws deal with the regulation of discarded medications in food products?, c) What are industry standards related to the discarding of medications in food products?, and d) How can the North Washington Fire Protection District mitigate the risk of medicinal marijuana in discarded food products within our community?

Background and Significance

The North Washington Fire Protection District (NWFPD) provides fire suppression and emergency medical services (EMS) for citizens residing in a 15 square mile area of unincorporated Adams County. This jurisdiction is adjacent to the north border of Denver, Colorado. The area is 40% residential (population 60,000) and 60% industrial (population 45,000). The department encounters an average of 2,500 EMS calls and 1,000 Fire calls per year. Ambulances respond from three strategically located stations to achieve a 4 1/2 minute response time. Patients are transported to any of the front-range area hospitals. All personnel are trained in EMS, Firefighting, and Hazardous

Materials response. NWFPD employees are also very dedicated to providing public education throughout the community. The Mission of the North Washington Fire Protection District is to reduce the loss of life and property, and to minimize injury or illness by providing education and prevention, as well as prompt and efficient fire, medical, and technical response capabilities. This mission takes ownership in ensuring that our community is protected from preventable risk.

On May 4th of 2010, a local news station (Fox 31 News) aired a story about a dog "Luke" found lifeless and unresponsive (Hemmat, 2010). Despite the initial concern of morbidity, it was determined that the dog was suffering from treatable marijuana toxicity. Hemmat reported that, "Luke found the pot when dumpster diving behind some marijuana dispensaries". Further investigations revealed the marijuana dispensary's alarming practice of product disposal in community dumpsters. This story definitely brings to light a risk for the safety of community pets but even more concerning is the possible risk to human beings.

The North Washington Fire Protection District serves a portion of our community that lives below the poverty level. Some of these individuals are homeless, living in shelters or modified housing near the north border of Denver. The Fox 31

News story raises the concern of similar marijuana exposures to these homeless people or children who are prone to searching for items in community dumpsters.

This concern is compounded by the growing number of dispensaries surrounding NWFPD. Regional growth is so profound that it has been dubbed by the Denver Post as "Pot Capital U.S.A." (Osher, 2010). Osher reports that, "there are more marijuana dispensaries than liquor stores, Starbucks coffee shops, or public schools". The following figure 1 retrieved from WeedMap.com, depicts the number and proximity of dispensaries to NWFPD.

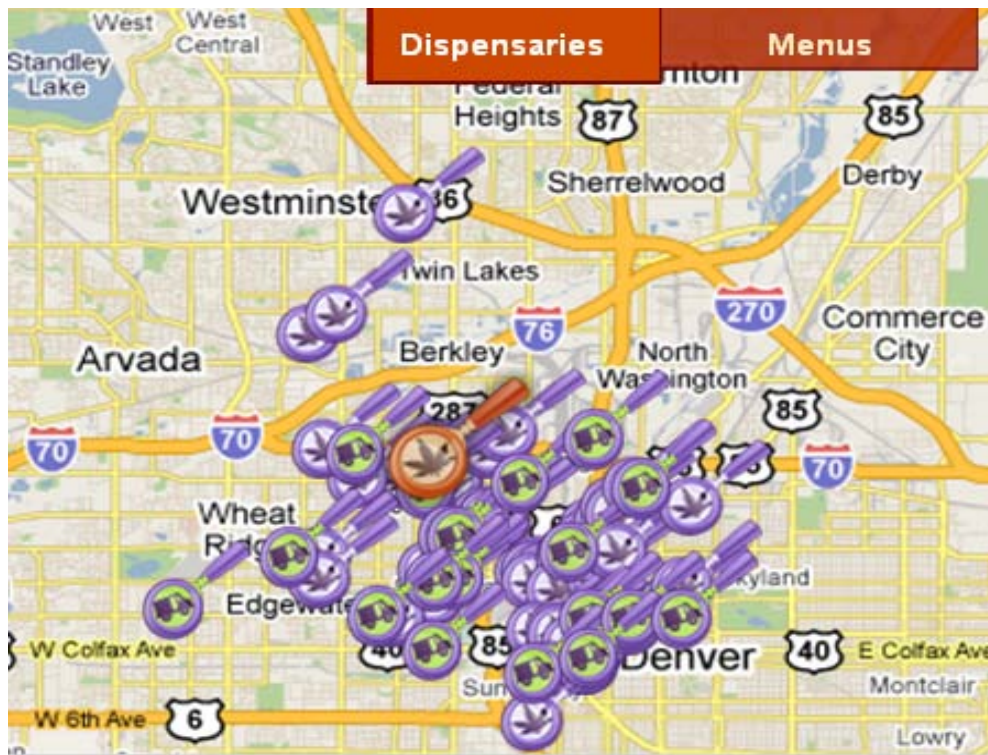


Figure 1. WeedMap-Denver (2010, August)

As these factors continue to compound at a rapid rate, it is paramount for NWFPD to evaluate the potential that medicinal marijuana dispensary practices place citizens at risk. This NWFPD concern is directly related to the Executive Analysis of Community Risk Reduction Course goal to "implement and lead community risk-reduction initiatives" (EACRR, 2010). This research will also involve one of the five United States Fire Administration (USFA) operational objectives. Addressing this problem will require NWFPD "to respond appropriately in a timely manner to emerging issues" (EACRR, 2001). The end result of any research should involve a response rather than simply identifying and evaluating a problem.

Literature Review

The need to assess the impact of medical marijuana dispensary disposal practices is necessary not only to find preventative community risk measures, but also to develop greater awareness for improved patient assessment and differentials when responding to a victim in need. The rapidly changing environment related to this issue has created a need for urgent evaluation. When Denver dispensaries outnumber (per capita) those of L.A. (Osher, 2010), the issue is of sizeable proportion. The continuing development of medicinal marijuana dispensaries has actually facilitated a demand for a local

marijuana college providing courses related to cultivation, growth operations, dispensary management, and legal issues (Greenway University, 2010).

Exponential growth in such a concentrated area creates a great potential for undesirable exposures. There are numerous accounts of family members, including children, being diagnosed with a THC overdose secondary to inadvertently consuming marijuana infused edibles (Boniface, 2010). These incidents create a difficult dilemma for NWFPD units determining a medical diagnosis related to patient symptoms and history of events when the exposure was unknown. In addition to increased exposure incidents, behavior modification can also create an increased need for EMS response. Auto accidents and other associated trauma can be the end result (Gilbert, 2010). These risks create an impact that can affect an entire community.

Communities struggle to make sense of these cultural changes. Opinions regarding the need for medical marijuana range from illegal and no medical use (U.S. DEA, 2010) to life changing therapy with no other medical alternatives (Dr. S, 2010). While this complex issue is not the focus of this research project, it cannot be ignored when looking at the dilemmas that administrators and legislators face.

The main focus of this research was to evaluate how the practices of medicinal marijuana dispensaries unnecessarily create additional risk to our communities. Inappropriate disposal of medication compounds the likelihood of additional exposures. There are multiple standards found in literature related to appropriate medication disposal (Harvard, 2010). Disposal recommendations vary with the level of regulatory requirement. The fifteen States with current Medical Marijuana legislation are faced with defining these standards (ProCon.org, 2010).

Observations during the review of this literature revealed what an emotional issue this has become not only for the authors of evaluated literature but also for communities in general. It was obvious that some opinions were from extreme polar opposites without any consideration for middle ground. This information is important to understand all of the components of such an emotional issue, but it is also important to extract the factual information from emotional opinion. Few dilemmas see successful resolution through implementation of extreme, non-compromising solutions.

Another reality of literature review for this research project was the ever changing information and data. This dynamic problem changed on a daily basis through new events, municipal

rule revisions, and State election issues. November saw numerous marijuana ballot issues both successful and defeated. Additional information was seen on a daily news reports, newspapers, and published journals.

Despite the prevalence of medicinal marijuana information, there was minimal literature specifically related to exposure to disposal of marijuana dispensary edibles. This was not a deterrent to completion of reliable research, but it did affect the procedure process. Personal interviews and collection of other data became a much needed component to supplement literature review for this descriptive research project.

Procedures

Through the use of descriptive research, efforts were made to identify strategies that would enable NWFPD to mitigate any community risks created by the disposal practices of medical marijuana dispensaries. An assessment of risk factors associated with medical marijuana discarded in food products was the first priority. If there is no evidence of a community risk, it is unnecessary to evaluate disposal standards and procedures.

Potential risks would be determined by researching the medical effects of marijuana on humans and animals; evaluating incidents with poor outcomes; and determining numbers and

likelihood of exposure incidents. These goals were achieved in part through literature review. Although there was sufficient data on medical affects and adverse incidents, limited information was available regarding exposure specifically related to dispensary disposal practices. To meet the needs of evaluating this component, surveys were conducted on a local as well as national level.

Medical Directors (and/or pre-hospital coordinators) of seven Denver-Metro hospitals in closest proximity to the highest concentration of dispensaries were contacted to determine current trends. The survey questions utilized were as follows:

- 1) What is the average yearly number of patients evaluated for symptoms of THC overdose?
- 2) Have the numbers changed in recent years with the increased development of marijuana dispensaries?
- 3) Are you aware of any incidents of exposure specifically related to discarded dispensary marijuana edibles?

This survey was completed during personal interviews to enable the exchange of additional information. Direct conversation enabled a 100% collection of data from the chosen facilities. The same questions were also presented to ten veterinary clinics neighboring the same region. Again, survey completion was

conducted through direct communication with clinic personnel to obtain more details. Only one of the ten chosen clinics could not be contacted.

Additional patient information from the Rocky Mountain Poison Center would include a perspective of patient exposures that may never actually seek medical care. The anonymity of this call-in advice network would provide additional valuable data. An interview with Manager Mary Hilko was conducted on January 12, 2010. The following information was requested:

1. What is the annual number of calls requesting assistance for medicinal marijuana symptoms?
2. Has the number of calls increased in recent years following development of marijuana dispensaries?
3. Are you aware of any incidents of exposure specifically related to discarded dispensary marijuana edibles?

The Rocky Mountain Poison Center had access to not only Rocky Mountain Regional data but National data as well.

On December 16, 2010 an interview was conducted with Julie Postlethwait, spokeswoman for the Colorado Department of Revenue's new Medical Marijuana Enforcement Division, to determine the number of marijuana facilities in the Denver-Metro region. This information would also be important for later

research on dispensary practices. In addition to discussions with Colorado regulators, a phone survey was conducted to glean information from each of the fifteen States (and D.C.) that have adopted medical marijuana legislation. Eleven of the sixteen programs were available for direct phone surveys; three others had adequate information on their web sites; and two provided little reliable information. This survey was conducted to evaluate risk as well as regulation issues. Questions specifically related to risks included:

1. What is the number of medicinal marijuana dispensaries in your State (D.C.)?
2. Are you aware of any incidents related to exposure of medicinal marijuana in discarded dispensary edibles?

This provided a comparison of data from other States facing similar dilemmas.

The phone survey with State Medical Marijuana officials also provided information related to the regulation portion (second question) of this research project. These questions included:

1. Who regulates your State's (D.C.'s) Medicinal Marijuana Dispensaries?

2. Are there regulations for the disposal procedures of discarded marijuana edibles?

This again provided comparison of multiple States and their regulatory practices. Due to the unique system data acquired from Maine's Medical Marijuana Program, additional interviews were conducted with two of the "District Dispensaries". Additional details to the same questions were provided by Jenna Smale and Rebecca Dekeuster (dispensary program directors).

Local regulation evaluation throughout the fifteen States (and D.C.) would be too complex of a task to complete in an acceptable time frame. It would be unreasonable to evaluate the numerous City, County, and Special District regulations. For this reason Local regulation was limited to the Denver and Adams County region near the NWFPD boundaries.

To gain more insight on regulation within the NWFPD boundaries, an interview was conducted on October 30, 2010 with Adams County Sheriff Doug Darr. A general discussion related to the practices of marijuana dispensaries and growers was conducted to determine the impact on local law enforcement. In addition to this interview and the multi-State survey, literature was readily available regarding marijuana regulation. Regulation and disposal procedures for other medications were also evaluated to provide an appropriate comparison.

The third question of interest for this research project was to evaluate industry standards related to the disposal of medication in food products. A simple evaluation of local medication handlers was completed by inquiring about their disposal procedures and regulations. Although many medications can be administered in food products, they are not distributed in the form of food products other than for lozenges, suckers, and popsicles. Since there are very few medications produced as a food product, a modification was required to obtain sufficient data. This variation would still provide data on medication disposal standards that should also be applicable to medicinal marijuana in food products. The survey was conducted through various handlers such as hospital pharmacies, local chain pharmacies, home healthcare agencies, and EMS agencies. Literature reviews also provided recommendations for personal home disposal procedures.

The final evaluation tool related to disposal standards specifically practiced by medical marijuana dispensaries. This research was completed in two parts. The first was an interview with Greenway College administrator Tom Ryan. The interview was based on disposal standards being taught as a part of their curriculum for any of the following courses:

- GU 101 - Understanding the Laws

- GU 102 - Opening an MMC/ Management
- GU 103 - MMJ Business Fundamentals 101
- GU 104 - Successful Cultivation / Grow Operations
- GU 105 - Introduction to Cultivation / Grow Operations
- GU 106 - Cultivation 101

This provided an educational basis for foundational standards.

The second portion related to dispensary disposal procedures was to conduct a survey of information obtained directly from local dispensaries. Fifty dispensaries in close proximity to NWFPD were contacted with the following questions:

1. Where does your dispensary discard unused medical marijuana edibles or byproducts on or off site?
2. Are these products rendered undesirable by combining with coffee grounds or cat litter?
3. Are these items discarded in a secured container?

Answers were obtained when possible through direct phone contact.

The fourth and final question to be answered by this research project was how NWFPD could mitigate the risks of

medicinal marijuana in discarded food products within our community. To evaluate this question a final survey was completed through an inquiry of other EMS agencies. Ten Denver Metro agencies were asked the following questions:

1. Have you had any incidents of patient exposure to medicinal marijuana in food products?
2. Do you have any medicinal marijuana dispensaries in your jurisdiction?
3. Have you done anything to address the possible risks of citizen exposure to medicinal marijuana in discarded food products?

Response to these questions was provided by e-mail format, direct communication at the Adams County EMS Council Meeting on January 10, 2010, and follow-up at the Denver Metro Medical Director's Meeting January 13, 2010.

Adaptation of the research process was found to be necessary due to the limited data available specifically regarding discarded medicinal marijuana infused edibles. This was understandable in light of new and developing issues related to this research project. Standards and regulations of medications in general were used to provide adequate comparative data.

Results

The first area of research was to evaluate the risks associated with medical marijuana discarded in food products. A general understanding of marijuana effects was necessary for this project regardless of intake method - inhalation or ingestion. The predominant agent of marijuana is Tetrahydrocannabinol (THC). A search of THC marijuana medical effects on humans revealed the following:

Physiological Effects of Marijuana

- Rapid heart rate
- Increased blood pressure
- Increased rate of breathing
- Increased appetite
- Slowed reaction time

Psychological Effects of Marijuana

- Distorted sense of time
- Paranoia
- Magical or "random" thinking
- Short-term memory loss

- Anxiety and depression

While effects of marijuana vary depending on the individual, absorption usually occurs within minutes. Symptoms may last for as long as twenty four hours. Depending on frequency of exposure, users may continue to test positive on drug screens up to one month after last consumption (Chakrabortly, 2010).

A survey of local hospitals (Appendix A) was completed to determine local human exposure frequency, growth rate, and specific dispensary related incidents. Unfortunately, research revealed that there was no current data to be found. None of the seven hospitals surveyed have included marijuana in their drug screen protocol since 2008. Denver Health Medical Center's data for the last half of 2008 showed 20.8% (843 of 4062) of all patient drug screens tested positive for THC. The consensus was that policy changes were made as a result of increased cost, and new liability issues vs. medical need. Since marijuana is not a respiratory depressant or cardio-toxic drug, there is no specific antidote or reversal therapy. Medical treatment is based on supportive care for presenting symptoms. Therefore inclusion of THC testing had been deemed unnecessary.

A response from the Rocky Mountain Poison Center unfortunately revealed similar results. Access to the regional and national data bases provided no specific code for medicinal

marijuana exposure reporting. Manager Mary Hilko expressed a need to change data collection parameters in light of discussions related to this research project. She apologetically stated that she had learned more about this issue during our conversations than she was able to contribute to with substantial data.

Despite little to no data being available from local hospitals or poison control, research provided numerous literature sources depicting adverse results from medicinal marijuana use. Incidents such as a 10-month-old being hospitalized for a THC overdose from eating trail-mix edibles (Boniface, 2010) and a teen involved in medical marijuana use being charged in a fatal accident (Gilbert, 2010) provide research evidence of possible risks.

Research also involved potential for animal exposures. As expected, documented animal exposures are primarily found to be a result of accidental ingestion. Caroline Donaldson, DVM, reported in her Veterinary Medicine Toxicology Brief that, "Dogs account for 96% of the exposures, cats account for 3%, and other species account for 1%." Effects of marijuana on animals included: depression, ataxia, agitation, vomiting, diarrhea, tachycardia, hypothermia, seizures, and coma (Donaldson, 2002). The onset of action occurs within 30 to 90 minutes, lasting up

to 72 hours. Consumable amounts of THC required to cause effects in animals are much less than for humans.

A survey of veterinary clinics, in the vicinity of Denver's Medicinal Marijuana Dispensaries, provided data regarding the frequency of animals exposed to this specific risk (Appendix B). Results showed that only 2 of the 9 veterinary clinics experienced more than two patients a year with symptoms of THC exposure. These two clinics were the only clinics to experience an increase in frequency associated with the development of Medicinal Marijuana Dispensaries. Animal House Veterinary Clinic had three patients in 2010 as compared to the typical one or none per year. Although only a slight increase, the clinic felt it was noteworthy. Two of the three patient's seen in 2010 were directly related to medicinal marijuana from dispensaries. One was from a trash container and the other exposure was secondary to consumption of a muffin infused with medicinal marijuana.

The data collected from Wheat Ridge Animal Hospital was significantly different from any other clinic. The 28 patient encounters in 2010 were extreme enough to warrant further research. A phone interview with Alissa Mazzaferro provided more detailed data (See Table 1).

Wheat Ridge Animal Hospital Data

Year	Patients
2005	9
2006	11
2007	9
2008	12
2009	24
2010	28

(Table 1)

This information showed the number of confirmed THC exposure patients to double in 2009 (coinciding with the year dispensaries began rapid development). Mazzaferro relayed recent cases in which two smaller breed dogs died secondary to ingestion of medicinal marijuana. One died of respiratory arrest and the other of hematemesis and aspiration (Mazzaferro telephone interview, 2011).

Human fatality data was researched through literature review. Utilizing FDA data, ProCon.org completed an evaluation to compare deaths from marijuana vs. certain FDA approved medications. The evaluation included data from January 1, 1997

(following approval of the first State to implement Medical Marijuana legislation) through June 30, 2005. The "Summary of Deaths by Drug Classification" revealed no deaths from marijuana as the primary cause of death. As a secondary cause (contributing to death) however, revealed 279 cases during that time period (ProCon.org, 2009).

A final research tool related to potential risk evaluated data specific to medicinal marijuana dispensaries surrounding NWFPD and the products they provide. The number of area dispensaries was difficult to compile since they would open or close on a monthly basis. Figure 1 Weed Map - Denver (2010, August), provided earlier as a background and significance item, provided a perspective of the multiple exposure possibilities. In addition, dispensary menus were evaluated to determine types of discarded edibles. The research showed that marijuana edibles are no longer limited to the usual brownies and muffins. The Ganja Gourmet's Menu (Appendix G), showed the diversity of current edibles. Pizza, tamales, cereals, ice creams, and soft drinks are but a few items available in addition to the typical baked good products. This revealed that there were many marijuana edibles that if unsold or only partially consumed would result in waste necessary for disposal and thus potential for risk of exposure.

The second area of research was to evaluate Federal, State, and Local laws that regulated the disposal of medication in food products. A search for medication disposal in general found Drug Enforcement Agency (DEA) requirements for controlled substances to have two disposal options. Option 1: "Destruction" through a witnessed burn process in a DEA approved incinerator and Option 2: "Reverse Distribution" transferring ownership to the DEA through an approved pharmaceutical returns processor (Harvard, 2010). Data regarding legislation of marijuana specifically revealed that Federal regulation established by the DEA lists Marijuana as a Schedule I substance. Under the Controlled Substance Act, Schedule I drugs are classified as, "having a high potential for abuse, no currently accepted medical use in treatment in the United States, and a lack of accepted safety for use of the drug or other substance under medical supervision" (U.S. DEA, 2010). This defines marijuana as an illegal substance that should not be possessed and as such there is no Federal legislation related to its disposal.

Despite the stance of the DEA, State Governments allowed citizens to take a different stance regarding legalization of marijuana for medicinal purposes (ProCon.org, 2010). In 1996 California became the first State to adopt legislation legalizing medicinal marijuana. Research, conducted through

phone surveys and website information provided by the States with Medical Marijuana Programs, quickly revealed that most States chose not to be involved with marijuana regulation. Only four States (New Jersey, New Mexico, Maine, and Rhode Island) had laws pertaining to dispensaries and marijuana practices. However, none of the rules addressed disposal of marijuana infused edibles. Interviews with Jenna Smale and Rebecca Dekeuster (Care Center Directors in Maine), provided practice standards that should be mirrored nationwide. Although they too are not bound by regulation, these Care Centers were the only facilities found to have a policy requiring the process of rendering discarded products undesirable (Smale and Dekeuster telephone interview, 2011). The other State Marijuana Programs, being in the majority, chose to only regulate distribution and certification of patient marijuana cards. Dispensaries in these States were either ruled illegal or regulation was deferred to local jurisdictions.

Research at the Local level was limited to the NWFPD vicinity (for reasons stated in this project's Procedures). The Denver Medicinal Marijuana Code concentrated primarily on licensing of dispensaries and distribution rules. The regulation related to marijuana infused edibles was limited to a reference to comply with "applicable State and local health regulations

related to the preparation, labeling, and sale of prepared food items" (D.R.M.C., 2010). Sheriff Doug Darr, relayed the position of Adams County was to comply with Federal Law and suspend any privileges afforded to local jurisdictions by Colorado's Amendment 20 (Darr interview, 2010).

The third area of research was to evaluate industry standards related to the discarding of medications in food products. As previously stated in the Procedures section a modification to the research was required. Although medications can be consumed by combining with food, there are few medications that are actually distributed as a food product. A look at medication disposal in general showed a wide range of standard requirements. The World Health Organization (WHO) published a statement regarding the proper disposal of controlled substances stating that, "they should be rendered unusable , by encapsulation or inertization, and then dispersed among the municipal solid waste in a land fill, or incinerated" (Herring, 2008).

The initial research about disposal focused on facility procedures (Appendix D). Pharmacies, in hospital and in retail stores, follow strict disposal guidelines imposed by both Federal and State regulation. Expired or unused medications must be discarded through a process of reverse distributors.

Medications are sent back to pharmaceutical companies for proper incineration. Regulations are so strict that some medications are even considered hazardous waste. Medications such as Insulin, Warfarin, Nicotine Patches, and live vaccines require disposal through a contracted hazardous waste disposal company.

In comparison health care providers such as home hospice care and EMS agencies are not held to such rigorous standards. Recommendations for these medication handlers are to simply discard medications in the trash in a safe manner. A "safe manner" means to place in a secured container or render undesirable so that children and animals exposure is limited. Typical practices include dissolving solid medication and mixing the rendered liquid into coffee grounds or cat litter. This practice mimics the Colorado Department of Public Health and Environment's public disposal recommendations. Citizens are also asked to render medications undesirable prior to disposal in the trash.

Although regulations and /or recommendations were found for all types of medications handlers, there are no standards for medicinal marijuana dispensaries. A survey of fifty local medical marijuana dispensaries found that none of them utilized the practice of rendering products undesirable. Only four of the fifty dispensaries had good business practices of placing

discarded products in a secure container. Finding absolutely no dispensary disposal standards led to an interview with the director of Greenway University. Tom Ryan was asked about disposal recommendations taught during the college's medical marijuana business courses. Ryan expressed concern regarding the basis of this research project but stated that current curriculum only informs students about legislative rules (Ryan telephone interview, 2010).

The final area of research evaluated potential solutions for NWFPD to mitigate the risk of citizen exposure to medicinal marijuana discarded in food products. A survey of ten neighboring EMS agencies found that they were unaware of specific medicinal marijuana patient incidents but their citizens were exposed to similar risks. Each jurisdiction had varying potential for risk based on the number of dispensaries within their boundaries and yet none of them had addressed policies to mitigate the problem. This was not unlike NWFPD's situation as the problem being researched was a new dilemma developing at a rapid rate.

Evaluation of a new and developing problem provided limited data or back ground addressing some of the specific research questions. The results of this research project obtained through literature review; self created surveys; and personal interviews

required a collection of comparative data. Information was compiled in a format that would allow like comparisons to facilitate answers to the specific research questions.

Discussion

The research explored for this project confirmed that medicinal marijuana discarded in food products is developing to be a legitimate issue for the citizens of the NWFPD. Psychological and physiological effects of marijuana; frequency of possible exposures; poor dispensary disposal regulations; and a general lack of awareness are all a formula for an unnecessary growth in community risk.

The question of risk factors was evaluated by looking at how marijuana affects both animals and humans; if there have been any incidents regarding medicinal marijuana; and also the prevalence of exposure possibilities. While Marijuana is primarily a psychogenic drug, there are physiologic affects to the human body as well (Chakrabortly, 2010). These physiologic affects are also found with animals requiring lower doses (Donaldson, 2002). These health related signs and symptoms may not be as extensive as reactions seen in overdoses of other medications, but they still pose a risk. Although the "Death from Marijuana v. 17 FDA-Approved Drugs" evaluation reported zero deaths with marijuana as the primary suspect of death, it

did report 279 deaths (in seven years) with marijuana as the secondary suspect contributing to death (ProCon.org, 2009). These numbers are not as dramatic as the reported numbers for other drug classifications such as anti-psychotics or anti-depressants, but still significant never the less. Incidents of medicinal marijuana (THC) related overdose or illness were very prevalent. A ten-month-old Commerce City boy was admitted to the Children's hospital after eating a medicinal marijuana trail-mix (Boniface, 2010). Although the ingested food product was not a dispensary discarded substance, it reveals the relevance of potential human related risks.

Data from the Wheat Ridge Animal Hospital, neighboring several medicinal marijuana dispensaries, showed a dramatic increase in animal exposures directly related to discarded edibles. While most physiological effects experienced by these animals were relieved in a matter of days, two recent patients died as a result of their symptoms. These patient experiences (human or animal) confirm that the physical effects of marijuana should not be minimized or as some would suggest to be completely ignored.

Risk results related to psychological effects may be of even greater concern. An Adams County teen who was "involved in medical use of marijuana" has been accused in a fatal accident

occurring October 1, 2010 (Gilbert, 2010). The psychological effects including distorted sense of time, short-term memory loss, and slowed reaction time can lead to devastating results. Lawmakers in Colorado are so concerned about these possibilities that Rep. Claire Levy is sponsoring a bill that would set a DUI limit for marijuana. Currently if you are suspected of being under the influence of marijuana, there isn't a test to measure your level of impairment (Boyd, 2011). This lack of regulation facilitates the continuation of dangerous behaviors that increase community risk.

A survey of hospitals was conducted to gain further evaluation of incidents. This unfortunately revealed a surprising lack of data. Interviews with Medical Directors and Pre-Hospital coordinators aroused their concerns to this new developing risk, but they revealed a change in policy that eliminated marijuana from patient drug screens. A consensus revealed that policy changes were related to cost versus benefit, as well as changing liability issues. This absence of problem specific data was also found with Rocky Mountain Poison Control and other national community health organizations. Their data base structures did not have codes or parameters to provide necessary information. As mention previously, these results have

opened the eyes of many participants prompting possible data collection modifications.

The probability of exposure was evident in the number of dispensaries proximal to NWFPD. While Weed Map (Figure 1), presented in the Background and Significance section, provides a good visualization, Colorado dispensary numbers are even more staggering. The Colorado Department of Revenue currently lists 809 licensed Care Centers, 319 Infusers, and 1218 Growers (Appendix C). This number of facilities prompted the National Organization for the Reform of Marijuana Laws to name Denver "America's Cannabis Capital" (Osher, 2010). Availability of medicinal marijuana is certainly not an issue.

There was significant data found to support the possible frequency of risk. Additionally, items such as Appendix G reveal the potential for unsuspected exposure. Unlike medications disposed with specific physical characteristics or containers, marijuana edibles may be discarded without recognizable traits. Medicinal marijuana infused food products discarded in public trash receptacles creates a risk without warning.

Disposal regulations that might limit these risks were found to be nonexistent. Interviews with State Marijuana Programs, Medicinal Marijuana Dispensaries, and the Director of Greenway University revealed that the absence of regulation was

a case of simply not considering the potential for risk. None of the individuals interviewed seemed to have resistance to disposal directives. Two Care Centers in Maine have actually implemented policies to render discarded products as safe. Jenna Smale and Rebecca Dekeuster described facility required practices of compacting disposables with coffee grounds or cat litter to deem an undesirable mixture that is then placed in a secured container (Smale and Dekeuster telephone interview, 2011). These policies would mirror the "Household Medical Waste Compliance Bulletin" provided by the Colorado Department of Public Health and Environment (CDPHE, 2010). While not intended to address the medicinal marijuana disposal issue, this bulletin was created as a tool for disposal of all medications to limit community risk and environmental impact. It requests that medications should no longer be disposed of in the water system through toilets or drains. Their studies have determined levels of medication in public water systems that may pose a threat to community health. To prevent further contamination, they outline a process of rendering medication undesirable prior to disposal in the trash (CDPHE, 2010). These same simple practices could eliminate community risk from medicinal marijuana without creating unnecessary burden on facility administrators.

Industry standards for facilities that have medication disposal regulations are in contrast much more involved. While EMS agencies and Home Health Care organizations follow the previously mentioned "Household Medical Waste" recommendations, facilities are required to utilize licensed contractors. They include redistributors as well as hazardous materials handlers (Appendix D). For these hospitals, local retail pharmacies; and pharmaceutical companies regulation is not an option (USDA, 2010). Should it be any different for medicinal marijuana dispensaries?

As dispensary regulation questions are answered by legislators and ballot issues, it is still the responsibility of emergency services to respond to the current risks. An evaluation of other EMS agencies showed that they are in the same position as NWFPPD regarding this community risk (Appendix F). Results showed not only that the issues had not been addressed, but also that most organizations were unaware of practices that exist to create a risk. They did not know that dispensaries are not regulated or that they discard marijuana products in unsecured community dumpsters. As there is no defined disposal regulation in any State (or D.C), other communities and their citizens are at risk as well.

The results of this study revealed an issue with great passion. Data obtained through literature and personal interviews required an objective view to avoid conclusions based on emotion. Although the question regarding the appropriateness of States legalizing marijuana was not addressed, it was certainly an undertone to many responses and publications. Several State Marijuana Program Administrators were frustrated about their position of managing a "quasi-legal" program that lacks regulation. Legal interpretation aside, it is very clear that rules need to be created to eliminate a growing community risk.

North Washington Fire Protection District finds itself in the midst of the medicinal marijuana dispensary issues. Inappropriate disposal of marijuana infused food products places a number of our homeless and children at risk. These risks may be realized by direct patient exposure or as a secondary result of another's behavior. It is clear that we need to be aware of these issues as well as participating in a solution to prevent them.

Recommendations

Solutions can be achieved by addressing the following needs:

1. Improved response through education of EMS professionals
2. Public Education
3. Education for Marijuana Dispensaries
4. Further research to improve data collection
5. Lobby for Legislative Regulation

The first solution to address the community risk presented by medical marijuana being discarded in public dumpsters is to prepare EMS personnel for possible emergency response. While reactionary solutions are not definitive, they can be more immediate. By educating EMS professionals about the probability of encountering patients with unknown exposures, they will be better prepared to care for patients through improved physical assessments and history taking. This education should also be extended to receiving facilities and other patient care providers. It was the unknown cause of symptoms exhibited by "Luke the dog" that almost led to extensive and potentially inappropriate care (Hemmat, 2010). Recognition of potential problems will at least provide for more appropriate patient care.

Education is also essential for the public. Preventing unknown exposures is much more effective than responding to

patients already exhibiting symptoms. Public education can be achieved through service announcements targeting the adult population. As mentioned previously CDPHE created a brochure to address other medication disposal issues. They would most certainly be willing to address it from this angle as well. "In school" instruction should be utilized to target the children. School health programs and fire safety programs provide us an already established avenue to distribute this new message. An informed community can reduce the number of patient exposures and the resulting need for emergency response.

Results of this research project also showed a need to educate medicinal marijuana dispensaries and State Marijuana Programs. Surveys exposed that most of these entities had never considered the need to control disposal products. The rapid evolution of this industry caused a system wide reaction that overlooked many details. The positive news from this project is that most facilities and programs were not opposed to changing their current practices. The interview with Greenway University Director Tom Ryan, revealed the same lack of awareness regarding potential risk, but a willingness to address the issue through curriculum changes (Ryan telephone interview, 2010). This tool provides an opportunity to make changes on a larger scale.

In addition to a general lack of awareness related to the potential risks of discarded medical marijuana in food products there is also a lack of specific topic related data. Hospitals, EMS Agencies, and Poison Control Centers have not yet established an appropriate parameter to evaluate patient data related to medicinal marijuana. The rapidly growing number of dispensaries in the Denver Metro Region (and other communities as well) necessitates the implementation of better data collection for further evaluation.

The final solution is to lobby for regulatory change. While most medicinal marijuana dispensary administrators were found to welcome disposal regulation, compliance by all requires specific legislation and enforcement. Although NWFPD is not directly involved in creating legislation, participation in influential committees will facilitate the awareness needed to make a change.

NWFPD can mitigate the community risk of medicinal marijuana in discarded food products by utilizing the information taken from this research project to affect change. It is our responsibility to address these needs for our community through education of our personnel and receiving facilities; public education; education of local dispensaries;

facilitating data collection; and being involved in the legislative process.

The results of this research project are very clear in revealing that this is an issue in numerous communities. Recommendations provided to address this dilemma can be implemented primarily through awareness. As additional States (and their communities) become involved with this issue; these risks must be addressed to eliminate an unnecessary community risk.

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Appendix A

2010 MEDICAL MARIJUANA - HOSPITAL SURVEY

<u>Hospital</u>	<u>Patients</u>	<u>Increase</u>	<u>Incidents</u>	<u>Contact</u>
SAN	unknown	don't track	unaware	Darcy Gentry R.N.
SAC	unknown	don't track	unaware	Darcy Gentry R.N.
NSMC	unknown	don't track	unaware	Dr. Tom Paluska
Denver Health	unknown	don't track	unaware	Dr. Christopher Colwell
Swedish	unknown	don't track	unaware	Erin Selby
Children's	unknown	don't track	unaware	Stephanie Haley-Andrews R.N.
Porter	unknown	don't track	unaware	Dr. Dylan Luyten

Note: It was found that none of the hospitals include THC as a part of a tox-screen

Due to the cost, legal protocol, and no medical need related to antidote. THC is neither cardio-toxic or a respiratory depressant. Physiological symptoms are managed by supportive care.

Denver Health old data report from July to December 2008

Screens	4062
Positive	843
Percentage	20.80%

Appendix B

2010 MEDICAL MARIJUANA - VETERINARY CLINICS PATIENTS

<u>Clinic</u>	<u># of patients</u>	<u>Increase</u>	<u>Dispensary Related</u>
4 Paws Animal Clinic	no contact	no contact	no contact
Animal Hospital at Hampden	none	no	n/a
Animal House Veterinary Clinic	3	slight	2 - 1 trash & 1 muffin at home
Blue Cross Animal Clinic	none	no	n/a
Campus Veterinary Clinic	1	no	unknown
Caring Hands	1	no	no
Hermosa Vet Clinic	2	no	unknown
Washington Park Clinic	none	no	n/a
Western Animal Clinic	none	no	n/a
Wheat Ridge Animal Hospital	28	significant	Several likely

Note: Four clinics referred possible exposure patients to Wheat Ridge Animal Hospital

Additional data from Alissa Mazzaferro DVM from Wheat Ridge Animal Hospital

<u>Year</u>	<u>Patients</u>
2005	9
2006	11
2007	9
2008	12
2009	24
2010	28

Two recent deaths of small dogs (1 - respiratory arrest; 1 - Hematemesis and Aspiration)

Appendix C

2010 STATE DISPENSARY SURVEY

	Enacted	Dispensary Regulation	# of Dispensaries	Disposal Regulations	Incidents	Contact
Alaska	1998	Unable to obtain reliable dispensary information				
Arizona	2010	In Development	Unknown	Not yet addressed	?	(Proposition 203)
California	1996	Local Jurisdiction	Thousands	Unknown	?	Board of Supervisors
Colorado	2000	In Development	809 Centers	In Development	2	Julie Postlethwait
DC	2010	In Development	Unknown	Not yet addressed	?	(Act B18-622)
Hawaii	2000	Not Legal	None Legal	None	?	Kieth Camede
Maine	1999	Yes	1 per District (8)	Not yet addressed	None	Samantha
Michigan	2008	Not Legal	None Legal	None	?	(www.michigan.gov)
Montana	2004	Not Legal	None Legal	None	Several	Roy Kemp
Nevada	2000	Unable to obtain reliable dispensary information				
New Jersey	2010	Yes	6 Care Centers	Not yet addressed	None	Eric Lieberman
New Mexico	2007	Yes	25 Producers	Not yet addressed	?	Donna Armijo
Oregon	1996	Not Legal	None Legal	None	None	Annette Johnston
Rhode Island	2006	Yes	None Legal	Not yet addressed	?	Charles Alexandre
Vermont	2004	Not Legal	None Legal	None	?	Sherry
Washington	1996	Not Legal	None Legal	None	None	Erin Seymour

Appendix D

2010 PHARMACEUTICAL HANDLERS SURVEY

<u>Agency</u>	<u>Disposal Procedure</u>
Walgreens	Return all expired meds to main distribution center. They advise citizens to follow CDPHE recommendations
King Soopers	Return all expired meds to main distribution center. They advise citizens to follow CDPHE recommendations
Blue Ridge	Stacy Barksdale Price (reverse distributor to pharmaceutical companies for incineration)
Denver Health	Reverse distributor
Centura	Kelly Griffith (reverse distributor or Hamat waste disposal for meds such as insulin, warfarin, live vaccines, etc.)
Children's	Reverse distributor
Porter Hospice	Cindi Baldwin, R.N. (crush pills and dissolve in liquid, then place in container with cat litter and dispose in trash)
CDPHE	Website - Local Take Back Programs or render medication undesirable with coffee grounds and place in trash
NWFPD	SOP - Expired medications are placed into training. Narcotics are discarded per DEA recommendations

NOTE:

The State of Colorado has facility regulations that are more stringent than Federal standards.

Some medications require hazardous materials contractors.

Appendix E

2010 MEDICAL MARIJUANA - DISPENSARY SURVEY

<u>Dispensary</u>	<u>Disposal Location</u>	<u>Render Undesireable</u>	<u>Secured Container</u>
24/7 Health Care Centers	Dump	no	yes
3-D Denver's Discreet Dispensary	Dump	no	no
5280 Meds	on-site	no	no
Advanced Cannabis Center	on-site	no	no
Alive Herbal Medicine	on-site	no	no
Alternative Wellness Center	Dump	no	no
At Home Remedies	on-site	no	no
Biocare	on-site	no	no
Botanico	on-site	no	no
Budding Health	on-site	no	no
Cannabis Station	on-site	no	no
Chronic Wellness	on-site	no	yes
Daddy Fat Sacks	on-site	no	no
DenCo	on-site	no	no
Denver Kush Club	on-site	no	no
Denver Patients Group	on-site	no	yes
Earth's Medicine	on-site	no	no
Farmacy	on-site	no	no
Giving Tree of Denver	on-site	no	no
Grass Roots Health & Wellness	on-site	no	no
Grasshopper Wellness Center	on-site	no	no
Green House	on-site	no	no
Happy Harvest	on-site	no	no
Health Joint	on-site	no	no
Herbal Spa	on-site	no	no
Herbal Wellness	Dump	no	no
Highland Health	on-site	no	no
House of Greens	on-site	no	no
Kushism	on-site	no	no
La Conte's Clone Bar & Dispensary	on-site	no	no
Lodo Wellness	on-site	no	no
Lotus Medical	on-site	no	no
Medication Station	Dump	no	no
Medicine Man	on-site	no	no
Mile High Medical	on-site	no	no
Native Roots Apothecary	on-site	no	no

Natural Remedies	on-site	no	no
Patients Plus	on-site	no	no
Rocky Mountain High	on-site	no	no
Sanctuary Wellness Center	on-site	no	no
Silver Lizard	on-site	no	no
Standing Akimbo	on-site	no	no
Summit Wellness	on-site	no	yes
Sweet Leaf	on-site	no	no
Tea Pot Lounge	on-site	no	no
Total Health Concepts	Dump	no	no
Urban Dispensary	Dump	no	no
VIM	on-site	no	no
Wellness Center	Dump	no	no
Zen Dispensaries	on-site	no	no

Note:

Only 8 of 50 Dispensaries discard products off site

None of the 50 Dispensaries render products undesirable

Only 4 of 50 Dispensaries discard products in a secure container

Appendix F

2010 MEDICAL MARIJUANA - EMS AGENCY SURVEY

<u>Agency</u>	<u>Incidents</u>	<u>Dispensaries</u>	<u>Plan</u>	<u>Contact</u>
Castlerock Fire	Unknown	maybe 6	none	Norris Croom
Denver Health Paramedics	Unknown	around 800	none	James Robinson
Federal Heights Fire	Unknown	2	none	Sean Ellis
North Metro Fire Rescue	Unknown	maybe 6	none	Ross Riley
North Washington Fire	Unknown	4	none	Dave Baldwin
South Metro Fire	Unknown	maybe a dozen	none	Mike Bilo
South West Adams County Fire	Unknown	possibly 2	none	Corey Davidson
Thornton Fire	Unknown	none	none	Bob Matoba
West Metro Fire	Unknown	unknown	none	Bob Marlin
Westminster Fire	Unknown	possibly 12	none	Rick Spahn

Appendix G



Ganja Gourmet's Dinner Buzz Specials

**Your choice of any Entrée, along with
any Dessert,
and an After-Dinner Joint = Just
\$30.00!!!**

**Ganja Gourmet's Chicken Pot Pies Now
Only \$10.00! (1.5 g)**

Free Starters:

**Ganjanade - Tasty Ganja Tapenade made with tomatoes, garlic,
and olives. Great dip for snacking.**

Selection of different food tastings!

**Your choice between a Chocolate chip or a Ganja Gourmet Cookie
- Chocolate & butterscotch chip cookies with glazed orange peel
(2g)**

Where else are you handed three FREE IncrEdibles just for walking in?!?

Entrées:

**Ganja House Pizza - Carnivore or Veggie (2g per
slice).....\$12.00
(12g whole pie, 6 large
slices).....\$59.00**

**Tamales -
Chicken or Veggie
(1.5g).....\$12.00**

**LaGanja - Meat or Veggie -
Served with medicated garlic bread
(2g).....\$15.00**

**Hummus & Curry Ganja Ganoush -
Served with pita, a stoner-creative Mediterranean dish
(5g).....\$20.00**

**Pot-Pot-Pie -
Beef Burgundy, Chicken Curry, or Veggie Curry
(2g).....\$15.00**

**Spinach Pie -
Spinach & feta cheese with a hint of garlic in a flaky delicious shell
(2g).....\$15.00**

**Bottled Ganjanade -
Tasty Ganja Tapenade made with tomatoes, garlic, and olives
(5.76g jar).....\$20.00**

Bottled Marinara -
Infused with herbs & Ganja! (5.76g jar).....\$20.00

Desserts:

Ganja Gourmet Crispy Treats -
Gourmet Crispy Treats with chocolate chips
(2g).....\$8.00

Ganja Gourmet Cookies -
Chocolate & butterscotch chip cookies with glazed orange peel
(2g).....\$6.00

Ganja Gourmet Chocolate Chip Cookie -
Freshly baked homestyle cookies
(2g).....\$6.00

Stardust Mocha Delight -
Double-fudge cookie with a hint of espresso
(1.5g).....\$6.00

Peanut Butter Dream -
Classic peanut butter cookie with chocolate and peanut butter chips
(2g).....\$6.00

Cinnamon Sugar Cookies -
Great with afternoon tea
(2g).....\$6.00

Almond Horns -
Almond cookie-cake dipped in chocolate and covered in almond slivers
(2g)..\$12.00

Brownies -
Sweet Raspberry, German chocolate, Chocolate Lovers, or Heath Bar
(2g).....\$ 8.00

Cheesecake -
Chocolate, Strawberry, Cherry or Blueberry
(1.5g).....\$12.00

Giant Chocolate Bombs -
Peanut Butter, Coconut, Almond, Coffee Bean
(2g).....\$10.00

Broadsterdam Space Cake -
Medicated white cake dipped in medicated chocolate,

with frosting in the middle
(3g).....\$12.00

Chocolate Mousse Cake -
Smooth and creamy chocolate with a chocolate crust
(1.5g).....\$10.00

Green-ola -
Granola bar with cranberries, chocolate chips, walnuts
and infused to perfection
(2g).....\$10.00

Baklava -
Cinnamon, honey and walnuts in a buttery shell
(2g).....\$10.00

Stoney Road Ice Cream -
Marshmallow, chocolate chips & almonds,
swirled in a creamy, STONEY blend
(2g).....\$12.00

